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EXAMINER	
TSAI, TSUNG YIN	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/763,791	Applicant(s) CHEN, MEI	
	Examiner Tsung-Yin Tsai	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 29 June 2007.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-9,11-19 and 21-29 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-9,11-19 and 21-29 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 23 January 2004 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date 6/1/2007.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAIL ACTION

Acknowledge of amendment received on 6/29/2007 and made of record.

Acknowledge of amendment to specification regarding abstract.

Acknowledge of amendment to claims.

Acknowledge of amendment to claims 1-6, 8-9, 11-16, 18-19, 21 and 25-29.

Acknowledge of canceling of claims 10, 20 and 30.

Response to Arguments

Applicant's argument – Amendment of abstract in the way addresses the Examiner's concern.

Examiner's response – Objection to abstract withdrawn.

Applicant's argument – Amendment objections to claims.

Examiner's response – Objection to claims withdrawn.

Applicant's argument – Wang does not disclose "determining for each of the identified motion clusters a respective spatiotemporal consistency value indicating persistence of the motion cluster in a respective spatial region across neighboring ones of the image frames," as now recited in claim 1.

Examiner's response – Want teaches determining for each of the identified motion clusters (figure 4 disclose where the image as a whole is map for identifying clusters of

motion vectors) a respective spatiotemporal consistency value (figure 3 discloses two image in sequences and both of these images are process for local motion estimator, the two sequence images are seen as spatiotemporal due to their side to side sequencing where the local motion estimator process the outputting value) indicating persistence of the motion cluster (figure 3 part 24a is seen as the persistence of the motion cluster due to its function of processing coherent motion region estimator across the sequencing frame) in a respective spatial region (figure 5 discloses where the sequencing images are shown to be process in by the same spatial region) across neighboring ones of the image frames (figure 3 part 20, figure 5).

Applicant's argument – Wang also does not disclose "selecting one of the identified motion clusters as a motion stabilization reference based on the spatiotemporal consistency values; determining a motion model describing motion of the motion stabilization reference in the image frame sequence; and producing a motion-stabilized version of the sequence of image frames based on the motion model," as now recited in claim 1.

Examiner's response – Wang teaches selecting one of the identified motion clusters (figure 8A step 42-46 discloses where clusters of motion vectors are selected) as a motion stabilization reference (figure 8A-8B steps testing pixels again the models, where the models are seen as the references) based on the spatiotemporal consistency values (figure 8B step 52 discloses the comparing of the pixel values to the model, where the models contain the spatiotemporal consistency value); determining a motion

model (figure 8A step 42-46 discloses where the clusters are computed for the creation of a model) describing motion of the motion stabilization reference (figure 8A-8B steps testing pixels again the models, where the models are seen as the references) in the image frame sequence (figure 8A step 40 discloses frames i and i+1, these are seen as image frame sequence); and producing a motion-stabilized version (figure 8A-8B, column 2 lines 45-55 where the process of the method will create a frame where the pixel assignments do not change significantly between iteration, this is seen as motion stable) of the sequence of image frames based on the motion model (figure 8A part 40 discloses the generating of a dense motion model).

Applicant's argument – Wang does not teaching anything about producing a motion-stabilized version of a sequence of image frames.

Examiner's response – Wang teaches a motion-stabilized version (column 2 lines 45-55 where the process of the method will create a frame where the pixel assignments do not change significantly between iteration, this is seen as motion stable) of a sequence of image frames (figure 8A step 40 discloses frames i and i+1, these are seen as image frame sequence).

Applicant's argument – This disclosure does not disclose anything about motion compensation.

Examiner's response – Wang teaches regarding motion compensation (figure 3 teaches where motion are to be detected, figure 8A-8B teaches the method where the motion is consider, column 2 lines 45-55 teaches where the process of the method will create a frame where the pixel assignments do not change significantly between iteration, this is seen as motion stable and compensation).

Applicant's argument – Nowhere in this disclosure, however, does Wang teach that a motion cluster is selected as a motion stabilization reference. In pertinent part, this disclosure only teaches that motion and boundaries associated with regions of coherent motion are determined (see, e.g., col. 6, lines 45-47). None of the regions of coherent motion, however, is selected as a motion stabilization reference.

Examiner's response – Wang teaches motion cluster (figure 8A step 42-46 discloses where clusters of motion vectors are selected) is selected as a motion stabilization reference (figure 3 teaches where sequence images are process to find coherency in development of a motion model and the model is seen as reference where pixels are compare to, column 2 lines 45-55 teaches where the process of the method will create a frame where the pixel assignments do not change significantly between iteration, this is seen as motion stable and compensation).

Applicant's argument – Each of claims 11 and 21 recites features that essentially track the pertinent features of independent claim 1 discussed above. Therefore, claims 11 and 21 are patentable over Wang for at least the same reasons explained above.

Examiner's response – Because Wang teaches the claimed recited features of 11 and 21 that track claim 1 they are still rejected.

Applicant's argument – Heisele does not make-up for the failure of Wang to teach or suggest the features of independent claims 1, 11, and 21 discussed above.

Examiner's response – Wang teaches claims 1, 11 and 21 as disclose above. The combine teaching of Heisele and Wang will further reduce the complexity and burden of analyzing and processing the image and the data storage. This is an important factor due to larger and larger image size that processors have to deal with and the limited processing resources of the hardware at hand.

Applicant's argument – The fact is that Heisele's system does not perform motion stabilization and, therefore, selecting a motion stabilization reference would not serve any useful purpose.

Examiner's response – Combing Wang and Heisele teaches the concept of computing for motion stabilization (column 2 lines 45-55 teaches where the process of the method will create a frame where the pixel assignments do not change significantly between iteration, this is seen as motion stable and compensation) and, therefore, selecting a

motion stabilization reference (figure 3 teaches where sequence images are process to find coherency in development of a motion model and the model is seen as reference where pixels are compare to).

Applicant's argument – Applicant asks the Examiner to point to a specific location in Heisele that discloses "computing respective measures of spatiotemporal consistency for the projected motion clusters."

Examiner's response – The combine teaches of Wang and Heisele teaches the concept of computing respective measures (Wang, figure 3 part 24a teaches the respective measure by coherent motion processing) of spatiotemporal consistency (figure 3 part 20 disclose processing of sequence images, these are the consistency) for the projected motion clusters (figure 3 part 22 disclose the locating the local motions in the image).

Applicant's argument – Ohm does not disclose that "motion vectors are re-classified with a modified clustering parameter in response to a determination that a computed spatiotemporal consistency measure is below a consistency threshold."

Examiner's response – Ohms teaches motion vectors (page 1 paragraph Introduction discloses motion vector field determination of the image) are re-classified with a modified clustering parameter (page 3 figure 2 discloses in part B where modified

clusters by those that are retained and those that are eliminated) in response to a determination that a computed spatiotemporal consistency (page 3 figure 2 part A disclose frame t to frame t+1, where the image process takes palce) measure is below a consistency threshold (page 3 paragraph 4-5 discloses where the threshold of 50% overlap requirement, this is seen as a consistency threshold value).

Applicant's argument – Claim 7 incorporates the features of independent claim 1; claim 17 incorporates the features of independent claim 11; and claim 27 incorporates the features of independent claim 21. Heisele does not make-up for the failure of Wang to teach or suggest the features of independent claims 1, 11, and 21 discussed above. Therefore, claims 7, 17, and 27 are patentable over Wang, Ohm, and Heisele for at least the same reasons explained above.

Examiner's response – With the combine teaches of Wang, Ohm, and Heisele as discloses above all these depend claims are rejected as well.

Claim Rejections – 35 USC 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 10-11, 20-21 and 30 are rejected under 35 U.S.C. 102(b) as being Wang et al (US Patent Number 5,557,684. IDS).

Wang et al disclose the following method carry out by a system:

(1) Regarding claims 1, 11 and 21:

computing respective sets of motion vectors for pairs of image frames (20-22 figure 3);

classifying the computed motion vectors into motion classes (figure 3, figure 8a-8b, column 5 lines 15-67 to column 6);

identifying motion clusters in the image frames based at least in part on the motion classes (figure 3, figure 8a-8b, column 5 lines 15-67 to column 6);

determining for each of the identified motion clusters (figure 4 disclose where the image as a whole is map for identifying clusters of motion vectors) a respective spatiotemporal consistency value (figure 3 discloses two image in sequences and both of these images are process for local motion estimator, the two sequence images are seen as spatiotemporal due to their side to side sequencing where the local motion estimator process the outputting value) indicating persistence of the motion cluster (figure 3 part 24a is seen as the persistence of the motion cluster due to its function of processing coherent motion region estimator across the sequencing frame) in a respective spatial region (figure 5 discloses where the sequencing images are shown to be process in by the same spatial region) across neighboring ones of the image frames (figure 3 part 20, figure 5);

selecting one of the identified motion cluster as a motion stabilization reference based on spatiotemporal consistency of the selected motion cluster across multiple image frames (figure 3, figure 8a-8b, column 5 lines 15-67 to column 6);

selecting one of the identified motion clusters (figure 8A step 42-46 discloses where clusters of motion vectors are selected) as a motion stabilization reference (figure 8A-8B steps testing pixels again the models, where the models are seen as the references) based on the spatiotemporal consistency values (figure 8B step 52 discloses the comparing of the pixel values to the model, where the models contain the spatiotemporal consistency value); determining a motion model (figure 8A step 42-46 discloses where the clusters are computed for the creation of a model) describing motion of the motion stabilization reference (figure 8A-8B steps testing pixels again the models, where the models are seen as the references) in the image frame sequence (figure 8A step 40 discloses frames i and i+1, these are seen as image frame sequence); and

producing a motion-stabilized version (figure 8A-8B, column 2 lines 45-55 where the process of the method will create a frame where the pixel assignments do not change significantly between iteration, this is seen as motion stable) of the sequence of image frames based on the motion model (figure 8A part 40 discloses the generating of a dense motion model).

Claim Rejections – 35 USC 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 8-9, 18-19 and 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al (US Patent Number 5,557,684. IDS.) in view of Heisele (Motion-Based Object Detection and Tracking in Color Image Sequences.).

Wang et al disclose the following above except:

(1) Regarding claims 8, 18 and 28:

wherein the selecting comprises projecting each motion cluster from image frames to respective neighboring image frames, and computing respective measures of spatiotemporal consistency for the projected motion clusters.

However, Heisele in the same field of endeavor disclose wherein selecting a motion cluster as a motion stabilization reference comprises projecting each motion cluster from image frames to respective neighboring image frames, and computing respective measures of spatiotemporal consistency for the projected motion clusters (page 2 left column lines 23. A consistent segmentation results over time is seen as the reference motion cluster over the image framesd.).

It would have been obvious to one skill in the art at the time of the invention to employ Heisele's teachings to Wang et al wherein selecting a motion cluster as a motion stabilization reference comprises projecting each motion cluster from image frames to respective neighboring image frames, and computing respective measures of spatiotemporal consistency for the projected motion clusters; such that the reference cluster will reduce the complexity and burden of the processor in process and data storage.

(2) Regarding claims 9, 19 and 29:

wherein the selecting comprises selecting as the motion stabilization reference for a given reference image frame the motion cluster having a greater spatiotemporal consistency value than the spatiotemporal consistency values of other ones of the motion clusters across multiple image frames neighboring the given reference image frame.

However, Heisele in the same field of endeavor disclose wherein the motion cluster selected as a motion stabilization reference for a given reference image frame has a greater spatiotemporal consistency measure than other motion clusters across multiple image frames neighboring the given reference image frame (page one, right column lines 14-25. Even with the reduction of data from this method it stills generate more motion data across the images.).

It would have been obvious to one skill in the art at the time of the invention to employ Heisele's teachings to Wang et al wherein the motion cluster selected as a motion stabilization reference for a given reference image frame has a greater spatiotemporal consistency measure than other motion clusters across multiple image frames neighboring the given reference image frame; such that not only does smaller data storage is required, but more information is generated from such small amount of data.

5. Claims 2-6, 12-16 and 22-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al (US Patent Number 5,557,684. IDS) in view of Ohm (Feature-Based Cluster Segmentation of Image Sequences. IDS.)

Wang et al disclose all of the above except for the following:

(1) Regarding claims 2, 12 and 22:

wherein the computing comprises generating for pairs of the image frames respective dense motion models describing motion at pixel locations with respective sets of parameter values in a motion parameter space.

However, Ohm in the same field of endeavor disclose wherein computing motion vectors comprises generating for pairs of image frames respective dense motion models describing motion at pixel locations with respective sets of parameter values in a motion parameter space (page 2, right column, paragraph "3 Weighting of feature" lines 1-7)

It would have been obvious to one skill in the art at the time of the invention to employ Ohm's teachings to Wang et al wherein computing motion vectors comprises generating for pairs of image frames respective dense motion models describing motion at pixel locations with respective sets of parameter values in a motion parameter space; such that it will be a efficiency use of processing image and smaller storage space. This will further be a more accuracy way of calculating motion vectors or image frames.

(2) Regarding claims 3, 13 and 23:

wherein the identifying comprises iteratively clustering ones of the motion vectors from a coarse image frame resolution level to a fine image frame resolution level.

However, Ohm in the same field of endeavor disclose wherein identifying motion clusters comprises iteratively clustering motion vectors from a coarse image frame resolution level to a fine image frame resolution level (page 2 paragraph "3 Weighting of features", page 3 paragraph "6 Results", page 3 paragraph "7 Conclusion").

It would have been obvious to one skill in the art at the time of the invention to employ Ohm's teachings to Wang et al wherein identifying motion clusters comprises iteratively clustering motion vectors from a coarse image frame resolution level to a fine image frame resolution level; such that when viewing the progression of the frames one can see smooth, pure translation motion and not the jerky or blurry image frames.

(3) Regarding claims 4, 14 and 24:

wherein at each image frame resolution level one of the motion vectors are classified into motion clusters, and a respective one of the spatiotemporal consistency value is determined for each of the clusters identified in a given image frame based on a projection of the motion cluster into a neighboring image frame using computed inter-frame motion.

However, Ohm in the same field of endeavor disclose wherein at each image frame resolution level motion vectors are classified into motion clusters,

and spatiotemporal consistency is determined for each cluster in a given image frame based on a projection of the motion cluster into a neighboring image frame using computed inter-frame motion (figure 2 of page 3, page 3 paragraph "4 Segment merging based on local feature analysis").

It would have been obvious to one skill in the art at the time of the invention to employ Ohm's teachings to Wang et al wherein at each image frame resolution level motion vectors are classified into motion clusters, and spatiotemporal consistency is determined for each cluster in a given image frame based on a projection of the motion cluster into a neighboring image frame using computed inter-frame motion; such that when viewing the progression of the frames one can see smooth, pure translation motion and not the jerky or blurry image frames. This will further be a more efficiency use of processing time of calculating motion vectors or image frames.

(4) Regarding claims 5,15 and 25:

wherein each of the respective spatiotemporal consistency values is determined based on degree of overlap between the respective motion cluster projected from the given image frame and a corresponding one of the motion cluster identify in the neighboring image frame.

However, Ohm in the same field of endeavor disclose wherein the spatiotemporal consistency is determined based on degree of overlap between a motion cluster projected from the given image frame and a corresponding motion

cluster in a neighboring image frame (figure 2 of page 3, page 3 paragraph "4 Segment merging based on local feature analysis" and "5 Segment tracking").

It would have been obvious to one skill in the art at the time of the invention to employ Ohm's teachings to Wang et al wherein the spatiotemporal consistency is determined based on degree of overlap between a motion cluster projected from the given image frame and a corresponding motion cluster in a neighboring image frame; such since this process is done already and the data storage, it will allow less processor time for the processor to execute the data when access by the user.

(5) Regarding claims 6, 16 and 26:

wherein one of the motion vectors are re-classified with a modified clustering parameter in response to a determination that the respective spatiotemporal consistency values are below a consistency threshold.

However, Ohm in the same field of endeavor disclose wherein motion vectors are re-classified with a modified clustering parameter in response to a determination that a computed spatiotemporal consistency measure is below a consistency threshold (figure 2 of page 3, page 3 paragraph "4 Segment merging based on local feature analysis" and "5 Segment tracking").

It would have been obvious to one skill in the art at the time of the invention to employ Ohm's teachings to Wang et al wherein motion vectors are re-classified with a modified clustering parameter in response to a determination that a computed spatiotemporal consistency measure is below a consistency

threshold; such since this process is done already and the data storage, it will allow less processor time for the processor to execute the data when access by the user.

6. Claims 7, 17 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al (US Patent Number 5,557,684. IDS) in view of Ohm (Feature-Based Cluster Segmentation of Image Sequences. IDS.) as applied in claims 3,13 and 23 above, and further in view of Heisele (Motion-Based Object Detection and Tracking in Color Image Sequences).

Wang et al and Ohm disclose all the above except the following:

(1) Regarding claims 7, 17 and 27:

wherein motion vectors are clustered iteratively in accordance with a clustering method.

However, Heisele in the same field of endeavor disclose wherein motion vectors are clustered iteratively in accordance with a clustering method (abstract, page 1 paragraph "1. Introduction", page 1 right column lines 14-40 to page 2 left column lines 1-11, page 2 paragraph "2. Motion Estimation by Clustering").

It would have been obvious to one skill in the art at the time of the invention to employ Heisele's to Wang et al and Ohm wherein motion vectors are clustered iteratively in accordance with a clustering method; such that the clustering procedure will make it easier for the processor to process groups of

pixels than individual pixels, thus lower the burden of the processor and creating faster display of the image.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tsung-Yin Tsai whose telephone number is (571) 270-1671. The examiner can normally be reached on Monday - Friday 8 am - 5 pm ESP.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on (571)272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Tsung-Yin Tsai
August 28, 2007

JINGGE WU
SUPERVISORY PATENT EXAMINER